

(19) World Intellectual Property
Organization
International Bureau



31 MAY 2005



(43) International Publication Date
8 July 2004 (08.07.2004)

PCT

(10) International Publication Number
WO 2004/056898 A3

(51) International Patent Classification⁷: C08F 293/00, C09J 153/00, C08L 53/00

(74) Agents: KIRK, Martin et al.; UCB, S.A., Allée de la Recherche, 60, B-1070 Brussels (BE).

(21) International Application Number:
PCT/EP2003/014658

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date:
19 December 2003 (19.12.2003)

(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(25) Filing Language: English

Published:
— with international search report

(26) Publication Language: English

(88) Date of publication of the international search report:
11 November 2004

(30) Priority Data:
02028900.5 23 December 2002 (23.12.2002) EP

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(71) Applicant (for all designated States except US): UCB, S.A. [BE/BE]; Allée de la Recherche, 60, B-1070 Brussels (BE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): SIMAL, François [BE/BE]; avenue Alexandre Bertrand, 11, B-1190 Forest (BE). TWEEDY, Harrell [US/US]; Fairwood Drive, Acworth, GA 30101 (US). VAN ES, Steven [BE/BE]; Avenue Brugmann, 288, B-1180 Uccle (BE). ROOSE, Patrice [BE/BE]; Brabantsebaan, 4, B-1600 St. Pieter Leeuw (BE).

WO 2004/056898 A3

(54) Title: ADHESIVES

(57) Abstract: There are disclosed star shaped thermoplastic elastomers made of acrylic block copolymers obtained by transition metal catalysed radical polymerisation. The elastomers comprise core arms obtained from monomers or mixture of monomers, whose T_g is from about -65°C to about -20°C, and of shell arms obtained from monomers or mixture of monomers, whose T_g is from about 70°C to about 160°C. The core copolymer has a polydispersity of 2 or higher and the final copolymer has a polydispersity of from 3 to 10.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/14658A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C08F293/00 C09J153/00 C08L53/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F C08L C09J C09D C08G C08K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	US 2003/013790 A1 (HUSEMANN ET AL) 16 January 2003 (2003-01-16) * page 2 para. 30 ; page 2, para. 22-27 ; page 3, para. 37 - page 4, para. 73 * -----	1-10
X	US 5 399 620 A (NIESSNER NORBERT ET AL) 21 March 1995 (1995-03-21) * column 2, line 45-52 ; column 1, line 57-68 ; column 2, line 57 - column 3, line 1 ; abstract ; column 2, line 31-40 * -----	1-10
X	EP 0 243 120 A (DU PONT) 28 October 1987 (1987-10-28) * page 7, line 25-30 ; page 5, line 15-35 ; page 12, line 1-8 ; claim 1 * -----	1-10
		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

- *&* document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

28 April 2004

23.08.2004

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Hammond, A

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/14658

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/43344 A (RIME FRANCOIS ; CIBA SC HOLDING AG (CH); MUEHLEBACH ANDREAS (CH)) 27 July 2000 (2000-07-27) * examples 5, 6 ; page 7, line 1 - page 8, line 6 ; page 12, line 3 - page 13, line 5 ; claims 1-15 * -----	1-10
X	US 6 310 175 B1 (YOSHIDA MASATOSHI ET AL) 30 October 2001 (2001-10-30) * claim 1 ; column 1, line 5-10 ; column 5, line 55-59 ; column 6, line 25-39, 15-24 ; examples and tables ; claims 2-10 ; column 5, line 16-25 ; abstract * -----	1-10
X	US 6 288 173 B1 (BARKAC KAREN A ET AL) 11 September 2001 (2001-09-11) * column 11, line 53-56 ; column 6, line 16 "ethyl acrylate" ; column 6, line 12-26 ; column 4, line 38-43 ; column 8, line 62-65 * -----	1-10
X	WO 86/00626 A (DU PONT) 30 January 1986 (1986-01-30) * abstract ; page 14, line 33 - page 16, line 29 ; claims 1-11 ; page 5, line 11 - page 14, line 30 ; example 23 * -----	1-10
X	WO 92/07014 A (DU PONT) 30 April 1992 (1992-04-30) claims 21, 26, 28-30, 34 ; page 23, line 5-20 ; page 18, line 1-5 ; page 19, line 31 - page 20, line 32 ; page 35, line 17-29 * -----	1-10
X	US 2002/115798 A1 (NARAYAN-SARATHY ET AL) 22 August 2002 (2002-08-22) * abstract ; claims 6,5,1-21 ; page 1, para.14 ; page 2, para.18 * -----	1,3,4, 6-10
X	US 5 756 585 A (FAYT ROGER ET AL) 26 May 1998 (1998-05-26) * abstract ; claims 1-29 * -----	1-10
A	WO 00/39233 A (HAESE FRANCOIS C D ; MA JINGJING (US); EVERAERTS ALBERT I (US); MINNES) 6 July 2000 (2000-07-06) * page 5, line 28 ; page 11, line 6-11 * -----	1-10
A	US 6 162 882 A (MATYJASZEWSKI KRZYSZTOF ET AL) 19 December 2000 (2000-12-19) * abstract ; column 1, line 25-35 ; column 7, line 51 - column 9, line 38 * -----	1-10
		-/-

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/14658

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 763 548 A (MATYJASZEWSKI KRZYSZTOF ET AL) 9 June 1998 (1998-06-09) * abstract ; column 6, line 30 ; column 14, line 1-30 * -----	1-10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/14658

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1 - 10

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10

A branched polymer product comprising an acrylic copolymer comprising one or more core arm(s) comprising one or more core polymer(s) and one or more shell arm(s) comprising one or more shell polymer(s) as detailed in the application claim 1.

The present claim 1 is a product-by-process claim and thus the product has been treated according to Guidelines, C, III, 4.7b for "product-by-process".

2. claims: 11-19

A method for producing a branched polymer comprising the process steps (a) - (e) as described in claim 11.

3. claims: 20-23

An adhesive composition comprising a branched copolymer as claimed in any of the claims 1-10.

4. claim: 24

A composition comprising 2 or more incompatible acrylic polymers together with a compatibilising agent as described in claim 24.

5. claim: 25

The use of a polymer as claimed in any of the claims 1-10 as a compatibilising agent for 2 or more incompatible acrylic polymers.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP 03/14658

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 2003013790	A1 16-01-2003	DE 10129611 A1		09-01-2003
		EP 1270701 A2		02-01-2003
		JP 2003055631 A		26-02-2003
US 5399620	A 21-03-1995	DE 4139962 A1		09-06-1993
		DE 59203105 D1		07-09-1995
		EP 0545184 A2		09-06-1993
EP 0243120	A 28-10-1987	AT 84809 T		15-02-1993
		AU 591769 B2		14-12-1989
		AU 7155187 A		22-10-1987
		BR 8701765 A		02-02-1988
		CA 1323715 C		26-10-1993
		DE 3783642 D1		04-03-1993
		DE 3783642 T2		03-06-1993
		DK 198187 A		19-10-1987
		EP 0243120 A2		28-10-1987
		ES 2037710 T3		01-07-1993
		JP 7086161 B		20-09-1995
		JP 62252449 A		04-11-1987
		MX 168843 B		11-06-1993
		NO 871616 A		19-10-1987
		US 5003004 A		26-03-1991
		ZA 8702756 A		28-12-1988
WO 0043344	A 27-07-2000	AU 2436100 A		07-08-2000
		CA 2359946 A1		27-07-2000
		WO 0043344 A1		27-07-2000
		EP 1144355 A1		17-10-2001
		JP 2002535423 T		22-10-2002
US 6310175	B1 30-10-2001	EP 1094086 A1		25-04-2001
US 6288173	B1 11-09-2001	AU 6047700 A		28-12-2000
		BR 0012106 A		12-03-2002
		CA 2376006 A1		14-12-2000
		EP 1185571 A2		13-03-2002
		JP 2003501517 T		14-01-2003
		JP 2004099907 A		02-04-2004
		WO 0075791 A2		14-12-2000
WO 8600626	A 30-01-1986	AT 48005 T		15-12-1989
		AU 583045 B2		20-04-1989
		AU 4547585 A		10-02-1986
		BR 8506816 A		25-11-1986
		CA 1253271 A1		25-04-1989
		DE 3574260 D1		21-12-1989
		DK 98486 A		04-03-1986
		EP 0188539 A1		30-07-1986
		ES 8700865 A1		01-02-1987
		HK 24390 A		06-04-1990
		JP 6067969 B		31-08-1994
		JP 61502610 T		13-11-1986
		KR 9102473 B1		23-04-1991
		NO 860802 A		04-03-1986
		NO 167869 B		09-09-1991
		WO 8600626 A1		30-01-1986
		US 4659782 A		21-04-1987

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP 03/14658

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO 8600626	A	US	4659783 A	21-04-1987
		ZA	8505083 A	25-03-1987
		US	4695607 A	22-09-1987
		US	4794144 A	27-12-1988
		US	4810756 A	07-03-1989
WO 9207014	A 30-04-1992	AU	8844191 A	20-05-1992
		WO	9207014 A1	30-04-1992
		US	5371147 A	06-12-1994
US 2002115798	A1 22-08-2002	NONE		
US 5756585	A 26-05-1998	FR	2649400 A1	11-01-1991
		AT	103943 T	15-04-1994
		CA	2063402 A1	11-01-1991
		DD	296497 A5	05-12-1991
		DE	69007884 D1	11-05-1994
		DE	69007884 T2	03-11-1994
		DK	408420 T3	18-07-1994
		EP	0408420 A1	16-01-1991
		ES	2063307 T3	01-01-1995
		WO	9100882 A1	24-01-1991
		JP	7025858 B	22-03-1995
		JP	5500827 T	18-02-1993
WO 0039233	A 06-07-2000	WO	0039233 A1	06-07-2000
		AU	2097799 A	31-07-2000
		EP	1144534 A1	17-10-2001
		JP	2002533556 T	08-10-2002
		US	6734256 B1	11-05-2004
US 6162882	A 19-12-2000	US	6111022 A	29-08-2000
		US	5945491 A	31-08-1999
		US	5789487 A	04-08-1998
		US	6124411 A	26-09-2000
		AU	3585997 A	02-02-1998
		BR	9710273 A	10-08-1999
		CA	2259995 A1	15-01-1998
		CN	1228789 A ,B	15-09-1999
		EP	0914352 A1	12-05-1999
		ID	18724 A	07-05-1998
		JP	2000514479 T	31-10-2000
		KR	2000023686 A	25-04-2000
		TW	397852 B	11-07-2000
		TW	552285 B	11-09-2003
		WO	9801480 A1	15-01-1998
US 5763548	A 09-06-1998	AU	720512 B2	01-06-2000
		AU	5306996 A	16-10-1996
		BR	9604887 A	30-11-1999
		CA	2216853 A1	03-10-1996
		CN	1183107 A	27-05-1998
		EP	0817806 A1	14-01-1998
		JP	3040172 B2	08-05-2000
		JP	10509475 T	14-09-1998
		TW	520380 B	11-02-2003
		US	6407187 B1	18-06-2002
		WO	9630421 A1	03-10-1996

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP 03/14658

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5763548	A	US 2002193538 A1	19-12-2002
		US 6512060 B1	28-01-2003
		US 6541580 B1	01-04-2003